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What is Claimed is:

1. A method for forming a hybrid active electronic and optical circuit using a lithography mask, the hybrid active electronic and optical circuit comprising an active electronic device and at least one optical device on a Silicon-On-Insulator (SOI) wafer, the
5 SOI wafer including an insulator layer and an upper silicon layer, the upper silicon layer including at least one component of the active electronic device and at least one component of the optical device, the method comprising projecting the lithography mask onto the SOI waver in order to simultaneously pattern the component of the active electronic device and the component of the optical device on the SOI wafer.
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2. The method of claim 1, wherein altering an electric voltage level applied to the active electronic device effects the free carrier distribution in a region of the optical device, and thereby changes the effective mode index of the region of the optical device.
- 15 3. The method of claim 1, wherein the optical device is an active optical device.
4. The method of claim 1, wherein the optical device is a passive optical device.
5. The method of claim 1, wherein the optical device is a focusing mirror.
- 20 6. The method of claim 1, wherein the optical device is an input/output coupler that couples light into a waveguide.
7. The method of claim 1, wherein the optical device is a Fabry-Perot cavity.

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8. The method of claim 1, wherein the optical device is a wavelength division multiplexer modulator.

9. The method of claim 1, wherein the optical device is an evanescent coupler.

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10. The method of claim 1, wherein the optical device is a diode.

11. The method of claim 1, wherein the optical device is a transistor.

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